

WHAT IS CLAIMED IS:

1. Active antiseptic water containing 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and substantially containing no chlorine.

2. An active antiseptic water-based fluid containing 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and substantially containing no chlorine.

3. The active antiseptic water-based fluid according to claim 2, wherein the active antiseptic water-based fluid is *sake*.

4. The active antiseptic water-based fluid according to claim 2, wherein the active antiseptic water-based fluid is *wine*.

5. The active antiseptic water-based fluid according to claim 2, wherein the active antiseptic water-based fluid is *juice*.

6. A production method for active antiseptic water or an active antiseptic water-based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, which comprises using a treatment apparatus having (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a

photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, and (4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out the steps of (i) generating a desired vibration between 10 and 200 Hz in a vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) breaking down, reducing, or removing halogen components in the water and converting the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions, by irradiating the photocatalyst or the photocatalyst and bactericidal metal with light for 30 minutes or longer.

7. A production method for active antiseptic water or an active antiseptic water-based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, which comprises using (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, (4) a light irradiator for emitting light to the photocatalyst

layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, and (5) a magnetic force generation member disposed inside the treatment tank; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out the steps of (i) generating a desired vibration between 10 and 200 Hz in a vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) breaking down, reducing, or removing halogen components in the water and converting the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions by irradiating the photocatalyst or the photocatalyst and bactericidal metal with light for 30 minutes or longer.

8. A production method for active antiseptic water or an active antiseptic water-based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, which comprises using as the vibrating stirrer (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, and (d) a vibration vane-fixing member; placing water or a water-containing fluid to be treated (water-based fluid,

including a fluid in the form of a paste) in the treatment tank; and carrying out the steps of (i) generating a desired vibration between 10 and 200 Hz in the vibration vane by using the vibration generator and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) breaking down, reducing, or removing halogen components in the water and converting the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions by irradiating the photocatalyst or the photocatalyst and bactericidal metal with light for 30 minutes or longer.

9. A production method for active antiseptic water or an active antiseptic water-based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, which comprises using as the vibrating stirrer an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or a vibration transmission member in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane; placing water or a water-containing fluid to be treated (water-based fluid, including

a fluid in the form of a paste) in the treatment tank; and carrying out the steps of (i) generating a desired vibration between 10 and 200 Hz in the vibration vane by using the vibration generator and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light, and (iii) allowing electric current to flow for 30 minutes or longer in the water or water-containing fluid to be treated to break down, reduce, or remove halogen components in the water and convert the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions, with at least one component selected from (a), (b), (c), and (d) serving as an anode or a cathode.

10. A production method for active antiseptic water or an active antiseptic water-based fluid that contains 0.08 to 0.5 mg/L of nitrite ions and/or sulfite ions, and that contains substantially no chlorine, which comprises using, as the vibrating stirrer, an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane and at least one auxiliary vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or a vibration transmission member in a non-immersed position in

a treatment bath, near the vibration generator and away from the vibration vane and auxiliary vane; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; carrying out the steps of (i) generating a desired vibration between 10 and 200 Hz in the vibration vane by using the vibration generator and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light, and (iii) allowing electric current to flow for 30 minutes or longer in the water or water-containing fluid to be treated to break down, reduce, or remove halogen components in the water and convert the nitrogen components contained in the water into nitrite ions, and/or sulfur components into sulfite ions, with at least one component selected from (a), (b), (c), and (d) serving as an anode or a cathode.

11. The production method for active antiseptic water or an active antiseptic water-based fluid according to any one of claims 6 to 10, wherein the photocatalyst layer or the layer comprising a photocatalyst and a bactericidal metal is disposed so as to cover at least a portion of the vibration vane and/or the auxiliary vane.

12. The production method for active antiseptic water or an active antiseptic water-based fluid according to any one of

claims 6 to 10, wherein the flow velocity of the treated fluid produced by vibration stirring is 150 mm/second or higher as measured with a three-dimensional electromagnetic flow meter.

13. The production method for active antiseptic water or an active antiseptic water-based fluid according to any one of claims 6 to 10, wherein (1) the treated fluid and/or (2) the photocatalyst layer or the layer comprising a photocatalyst and a bactericidal metal are exposed to ultrasonic waves.

14. A production apparatus for active antiseptic water or an active antiseptic water-based fluid, comprising (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, and (4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, wherein the light irradiator comprises (i) a light source, (ii) a light-leaking portion disposed near and/or in close contact with the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal inside the treatment tank, and (iii) an optical fiber for optically connecting the light source and the light-leaking portion.

15. The production apparatus for active antiseptic water or an active antiseptic water-based fluid according to claim 14, further comprising (5) a magnetic force generation member disposed inside the treatment tank.

16. The production apparatus for active antiseptic water or an active antiseptic water-based fluid according to claim 14, wherein the vibration stirrer comprises (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, and (d) a vibration vane-fixing member.

17. The production apparatus for active antiseptic water or an active antiseptic water-based fluid according to claim 14, wherein the vibrating stirrer is an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or the vibration transmission member in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane.

18. The production apparatus for active antiseptic water



or an active antiseptic water-based fluid according to claim 14, wherein the vibrating stirrer is an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane and at least one auxiliary vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or the vibration transmission member in a non-immersed position in the treatment bath, near the vibration generator and away from the vibration vane and auxiliary vane.

19. The production apparatus for active antiseptic water or an active antiseptic water-based fluid according to claim 14, wherein the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal is disposed so as to cover a portion of the vibration vane and/or auxiliary vane.

20. The production apparatus for active antiseptic water or an active antiseptic water-based fluid according to claim 14, wherein the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal and the light-leaking portion are formed on at least a portion of a plate-like body, and one or a plurality of plate-like bodies is disposed inside the treatment tank, facing in a direction that least obstructs the flow produced by vibration stirring.

21. The production apparatus for active antiseptic water or an active antiseptic water-based fluid according to claim 14, further having an ultrasonic emitter.

22. A method for breaking down, reducing, or removing halogen components contained in water, which comprises using a treatment apparatus having (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, and (4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out operations (i) and (ii) for 1 minute or longer and less than 30 minutes, the operations comprising the steps of (i) generating a desired vibration between 10 and 200 Hz in a vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light.

23. A method for breaking down, reducing, or removing halogen components contained in water, which comprises using (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank,

(3) a photocatalyst layer or a layer having a photocatalyst and a bactericidal metal, disposed on any surface inside the treatment tank, (4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, and (5) a magnetic force generation member disposed inside the treatment tank; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out operations (i) and (ii) for 1 minute or longer and less than 30 minutes, the operations having the steps of (i) generating a desired vibration between 10 and 200 Hz in a vibration vane by using a vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light.

24. A method for breaking down, reducing, or removing halogen components contained in water, which comprises using as the vibrating stirrer (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, and (d) a vibration vane fixing member; placing water or a water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out operations (i) and (ii) for 1 minute or longer and less than 30 minutes, the operations having the steps of (i)

generating a desired vibration between 10 and 200 Hz in the vibration vane by using the vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, and (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light.

25. A method for breaking down, reducing, or removing halogen components contained in water, which comprises using, as a vibrating stirrer, an insulated vibrating stirrer comprising (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or a vibration transmission member disposed in a non-immersed position in the treatment bath, near the vibration generator and away from the vibration vane; placing water or water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out operations (i), (ii), and (iii) for 1 minute or longer and less than 30 minutes, the operations having the steps of (i) generating a desired vibration between 10 and 200 Hz in the vibration vane by using the vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, (ii) irradiating the photocatalyst or the photocatalyst and bactericidal

metal with light, and (iii) allowing electric current to flow in the water or water-containing fluid to be treated, with at least one component selected from (a), (b), (c), and (d) serving as an anode or a cathode.

26. A method for breaking down, reducing, or removing halogen components contained in water, which comprises using, as a vibrating stirrer, an insulated vibrating stirrer comprising (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane and at least one auxiliary vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or the vibration transmission member disposed in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane and the auxiliary vane; placing water or water-containing fluid to be treated (water-based fluid, including a fluid in the form of a paste) in the treatment tank; and carrying out operations (i), (ii), and (iii) for 1 minute or longer and less than 30 minutes, the operations having the steps of (i) generating a desired vibration between 10 and 200 Hz in the vibration vane by using the vibration generator, and transmitting the vibrations to the vibration vane to cause the vibration vane to vibrate at an amplitude of 0.01 to 15 mm, (ii) irradiating the photocatalyst or the photocatalyst and bactericidal metal with light, and (iii) allowing electric current to flow in the water or

water-containing fluid to be treated, with at least one component selected from (a), (b), (c), and (d) serving as an anode or a cathode.

27. The method for breaking down, reducing, or removing halogen components contained in water according to any one of claims 22 to 26, wherein the photocatalyst layer or the layer comprising a photocatalyst and a bactericidal metal is disposed so as to cover a portion of the vibration vane and/or auxiliary vane.

28. The method for breaking down, reducing, or removing halogen components contained in water according to any one of claims 22 to 26, wherein the flow velocity of the treated fluid produced by vibration stirring is 150 mm/second or higher as measured with a three-dimensional electromagnetic flow meter.

29. The method for breaking down, reducing, or removing halogen components contained in water according to any one of claims 22 to 26, wherein (1) the treated fluid and/or (2) the photocatalyst layer or the layer comprising a photocatalyst and a bactericidal metal are exposed to ultrasonic waves.

30. An apparatus for breaking down, reducing, or removing halogen components contained in water, comprising (1) a treatment tank, (2) a vibrating stirrer disposed inside the treatment tank, (3) a photocatalyst layer or a layer having a photocatalyst and

a bactericidal metal, disposed on any surface inside the treatment tank, and (4) a light irradiator for emitting light to the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal, disposed inside and/or outside the treatment tank, wherein the light irradiator comprises (i) a light source, (ii) a light-leaking portion disposed near and/or in close contact with the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal inside the treatment tank, and (iii) an optical fiber for optically connecting the light source and the light-leaking portion.

31. The apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, further comprising (5) a magnetic force generation member disposed inside the treatment tank.

32. The apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, wherein the vibrating stirrer comprises (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, (d) a vibration vane-fixing member.

33. The apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, wherein

the vibrating stirrer is an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or the vibration transmission member in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane.

34. The apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, wherein the vibrating stirrer is an insulated vibrating stirrer having (a) a vibration generator, (b) a vibration rod connected to the vibration generator or a linkage section between the vibration generator and the vibration rod, (c) at least one vibration vane and at least one auxiliary vane fixed to the vibration rod, (d) a vibration vane-fixing member, and (e) an insulation member for electrically separating the vibration rod or the vibration transmission member in a non-immersed position in a treatment bath, near the vibration generator and away from the vibration vane and the auxiliary vane.

35. The apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, wherein the photocatalyst layer or the layer having a photocatalyst and a bactericidal metal is disposed so as to cover a portion of the



vibration vane and/or the auxiliary vane.

36. The apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, wherein the photocatalyst layer, or the layer having a photocatalyst and a bactericidal metal, and the light-leaking portion are formed on at least a portion of a plate-like body, and one or a plurality of plate-like bodies is disposed inside the treatment tank, facing in a direction that least obstructs the flow produced by vibration stirring.

37. An apparatus for breaking down, reducing, or removing halogen components contained in water according to claim 30, further comprising an ultrasonic emitter.